# CLAIMS

1. The device for the abrasive blasting comprising:

(a) a nozzle gun (10), comprising:

a cylindrical body (102) with an air-cooling chamber (104) formed by a sleeve (106) with a solid wall installed to form a maze, a combustion chamber (108) with a perforated wall (112) and a tubular element (114) for air/abrasive mixture feeding connected to a feeding tube (120) located concentrically and fastened to each other;

a swirler (124) for the gaseous oxidant for preparing of the fuel blend, equipped with spiral grooves communicating with compressed air feeding pipe (116);

orifices (162) connected with liquid fuel feeding pipe (118) located on the combustion chamber input between the latter's perforated wall and the tubular element;

an output nozzle (128) equipped with a means for axial displacement and fastening to the cylindrical body communicating with the air cooling chamber;

an ignition spark plug (132) located in the combustion chamber;

(b) a tank (40) for the liquid fuel the output of which communicates to the liquid fuel feeding pipe to the nozzle gun combustion chamber;

(c) an air/abrasive mixer comprising a vessel (20) for abrasive, the output tube of which is connected through a batcher (21) to an ejection-type mixer (22) communicating to the air/abrasive channel feeding pipe of the nozzle gun;

(d) a receiver (30) with a feeding pipe for connection to the compressed air source communicating to said vessel (20) for abrasive and liquid fuel tank (40), with the ejector pipe of the mixer and with the compressed air channel feeding pipe of the nozzle gun,

wherein

the nozzle gun (a) (10) comprises a swirler (122) of the fuel blend, while the combustion chamber(108) at its perforated wall area (110) is embodied with variable cross-section and possesses at least one area (136, 138) narrowing with respect to end cylindrical sections (140, 142);

the input part (146) of the tubular element (114) for air/abrasive mixture feeding is fastened to the body through two cylindrical spacers (148, 150) located concentrically forming between them the annular cavity (152) for fuel feeding to the fuel blend swirler (122);

the first said cylindrical element (148) possesses at one end a counterbore (154) for fastening of the flange of the tubular element input part, and on the other end, the through spiral grooves (164) on the external surface operating as the fuel blend swirler;

the second said cylindrical element (150) possesses a lateral channel (158) connected to the liquid fuel feeding pipe (118) to said cavity, the external threaded part (194) for fastening of the body, the counterbore (161) for fastening the cooling chamber sleeve, and orifices (162) connecting said cavity (152) to the air cooling chamber (104).

2. The device according to Claim 1, wherein

the means (130) for axial displacement and fastening of the output nozzle (128) to the cylindrical body (102) and to the combustion chamber (108) cylindrical part comprises a profile bush (168), a check-nut (170) and a cylindrical holder (172) fastened to the body,

the profile bush (168) possesses a groove (174) for the nozzle, and the external surface possesses a flange (176) and a threaded part (178) ending with the recess (180) conjugated with the internal thread of the cylindrical holder and the check-nut;

the cylindrical holder (172) possesses an annular chamber for cooling of the profile bush and the nozzle connected to the chamber (104) for air cooling through axial holes (186) communicating with the counterbore on the profile bush communicating with the combustion chamber.

3. The device according to Claims 1 or 2, wherein

the perforations (110) of the wall (112) of the combustion chamber are located along the spiral the convolutions of which are parallel to the spiral grooves of the both swirlers (122, 124).

4. The device according to any of Claims 1 to 3, wherein

the wall (112) of the combustion chamber at the perforated part (110) is embodied corrugated.

5. The device according to any of Claims 1 to 4, wherein

the input part (146) of the tubular element is embodied conical, and said first cylindrical element (148) possesses an external threaded part with the conical nut for fastening the hose to said conical part of the tubular element.

6. The device according to any of Claims 1 to 5, wherein

the nozzle (128) is embodied out of refractory abrasive-resistant ceramic material.

7. The device according to Claim 1, wherein

the air/abrasive mixer (c) possessing the batcher (21, 218) comprises a slide-valve rod (220) and a seat (222) with the axial channel and is equipped with a means for independent regulation of the seat (222) position with respect to the position of the slide-valve rod and a means (237) for abrasive loosening;

the mixer (22, 226) is installed so as to provide for free rotation with respect to the output pipe (230) of the abrasive vessel (210) in case of changing of the hose (39) position;

the cylindrical body of the mixer is rigidly fastened to the batcher body and communicates thereto through the hole (227) in the side wall;

the batcher (218) body from the seat (222) side is connected to the output pipe (214) of the abrasive vessel providing for seat rotation and displacement in the axial direction;

the means for abrasive loosening is embodied as ribbing (237) of the external part of the slide-valve rod (220) beyond the zone of interaction with the seat, said rod possessing the through channel along the entire length (244) communicating to the receiver (30) in case of the batcher blow purging;

the slide-valve rod (220) is installed so as to provide its separate spinning and reciprocal motion, for which purpose its free end (240) is connected to spinning and reciprocating drives (242).

8. The device according to Claim 7, wherein

the means providing free spinning of the mixer (226) with respect to the discharge pipe (214) of the abrasive vessel and displacement of the seat (222) in the axial direction is embodied as a flanged screwed cap (262), with its internal threading matching the external thread of the discharge pipe (214) of the abrasive vessel, the flanging being installed freely in the annular mortise between the groove (266) on the batcher body and the rear surface (268) of the seat bush linked by the threaded coupling (270).

9. The device according to Claim 7 or 8, wherein

the screwed cap (262) is linked to the mechanism for its spinning, preferably through an additional pneumatic drive (276) with rack-and-pinion gear, the pinion (279) being linked to the screwed cap (262).

10. The device according to any of Claims 7 to 9, wherein

the slide-valve rod drive is embodied as at least one pneumatic drive (242) linked to the mechanisms for rod spinning and axial reciprocating (290, 291).

11. The device according to Claim 7, wherein

the batcher additionally comprises the means for throat regulation embodied as a bush (271) of abrasive-resistant rubber being deformed in its cross-sectional plane by the plates (274) linked to the drive and sliding along the guides (273).

12. The nozzle gun (a) for the device for the abrasive blasting comprising:

a cylindrical body (102) with an air-cooling chamber (104) formed by a sleeve (106) with a solid wall installed to form a maze, a combustion chamber (108) with a perforated wall (112) and a tubular element (114) for air/abrasive mixture feeding connected to a feeding tube (120) located concentrically and fastened to each other;

a swirler (124) for the gaseous oxidant for preparing of the fuel blend, equipped with spiral grooves communicating with compressed air feeding pipe (116);

orifices (162) connected with liquid fuel feeding pipe (118) located on the combustion chamber input between the latter's perforated wall and the tubular element;

an output nozzle (128) equipped with a means for axial displacement and fastening to the cylindrical body communicating with the air cooling chamber;

an ignition spark plug (132) located in the combustion chamber,

wherein

additionally a swirler (122) of the fuel blend is comprised, while the combustion chamber(108) at its perforated wall area (110) is embodied with variable cross-section and possesses at least one area (136, 138) narrowing with respect to end cylindrical sections (140, 142);

the input part (146) of the tubular element (114) for air/abrasive mixture feeding is fastened to the body through two cylindrical spacers (148, 150) located concentrically forming between them the annular cavity (152) for fuel feeding to the fuel blend swirler (122);

the first said cylindrical element (148) possesses at one end a counterbore (154) for fastening of the flange of the tubular element input part, and on the other end, through spiral grooves (164) on the external surface operating as the fuel blend swirler;

the second said cylindrical element (150) possesses a lateral channel (158) connected to the liquid fuel feeding pipe (118) to said cavity, the external threaded part (194) for fastening of the body, the counterbore (161) for fastening the cooling chamber sleeve, and orifices (162) connecting said cavity (152) to the air cooling chamber (104).

13. The device according to Claim 12, wherein

the means (130) for axial displacement and fastening of the output nozzle (128) to the cylindrical body (102) and to the combustion chamber (108) cylindrical part comprises a profile bush (168), a check-nut (170) and a cylindrical holder (172) fastened to the body,

the profile bush (168) possesses a groove (174) for the nozzle, and the external surface possesses a flange (176) and a threaded part (178) ending with the recess (180) conjugated with the internal thread of the cylindrical holder and the check-nut;

the cylindrical holder (172) possesses an annular chamber for cooling of the profile bush and the nozzle connected to the chamber (104) for air cooling through axial holes (186) communicating with the counterbore on the profile bush communicating with the combustion chamber.

14. The device according to Claim 12 or 13, wherein

the perforations (110) of the wall (112) of the combustion chamber are located along the spiral the convolutions of which are parallel to the spiral grooves of the both swirlers (122, 124).

15. The device according to any of Claims 12 to 14, wherein

the wall (112) of the combustion chamber at the perforated part (110) is embodied corrugated.

16. The device according to any of Claims 12 to 15, wherein

the input part (146) of the tubular element is embodied conical, and said first cylindrical element (148) possesses an external threaded part with the conical nut for fastening the hose to said conical part of the tubular element.

17. The device according to any of Claims 12 to 16, wherein

the nozzle (128) is embodied out of refractory abrasive-resistant ceramic material.

18. The air/abrasive mixer (c) for the device for the abrasive blasting comprising:

a vessel (20) for abrasive, the output tube (214) of which is connected through a batcher (21) to an ejection-type mixer (22);

a discharge output pipe 230 of the mixer connected with a flexible hose to the feeding tube (120) for air/abrasive mixture feeding to the nozzle gun (10);

a means (30, 36) for abrasive vessel (20) and union (228) of the mixer ejector pipe connecting to the receiver,

wherein

the batcher (21, 218) comprises a slide-valve rod (220) and a seat (222) with the axial channel and is equipped with a means for independent regulation of the seat (222) position with respect to the position of the slide-valve rod and a means (237) for abrasive loosening;

the mixer (22, 226) is installed so as to provide for free rotation with respect to the output pipe (230) of the abrasive vessel (210) in case of changing of the hose (39) position;

the cylindrical body of the mixer is rigidly fastened to the batcher body and communicates thereto through the hole (227) in the side wall;

the batcher (218) body from the seat (222) side is connected to the output pipe (214) of the abrasive vessel providing for seat rotation and displacement in the axial direction;

the means for abrasive loosening is embodied as ribbing (237) of the external part of the slide-valve rod (220) beyond the zone of interaction with the seat, said rod

possessing the through channel along the entire length (244) communicating to the receiver (30) in case of the batcher blow purging;

the slide-valve rod (220) is installed so as to provide its separate spinning and reciprocal motion, for which purpose its free end (240) is connected to spinning and reciprocating drives (242).

19. The device according to Claim 18, wherein

the means providing free spinning of the mixer (226) with respect to the discharge pipe (214) of the abrasive vessel and displacement of the seat (222) in the axial direction is embodied as a flanged screwed cap (262), with its internal thread (264) matching the external thread of the discharge pipe (214) of the abrasive vessel, the flanging (263) being installed freely in the annular mortise between the groove (266) on the batcher body and the rear surface (268) of the seat bush linked by the threaded coupling (270).

20. The device according to Claim 18 or 19, wherein

the screwed cap (262) is linked to the mechanism for its spinning, preferably through an additional pneumatic drive (276) with rack-and-pinion gear, the pinion (279) being linked to the screwed cap (262).

21. The device according to any of Claims 18 to 20, wherein

the slide-valve rod drive is embodied as at least one pneumatic drive (242) linked to the mechanisms for rod spinning and axial reciprocating (290, 291).